Faculty of Engineering,		**Database Systems.**
Computer & A. Control Eng. Dept.	***Time Allowed :- 3 hours***	**3rd Year Students.**

ANSWER THE FOLLOWING QUESTIONS, YOU MAY ASSUME ANY MISSING DATA.

Question 1 (20 points)

a) Briefly explain the following "A database is an integrated resource shared by various users."
b) Give at least four applications for database systems
c) Discuss briefly the main limitations of file system based approach to database.
d) Discuss briefly the main disadvantages of DBMSs
e) Discuss briefly the Three-schema architecture. What are its main advantages?
f) Discuss briefly the allowable authentication modes in MS SQL Server 2005

Question 2 (20 points)

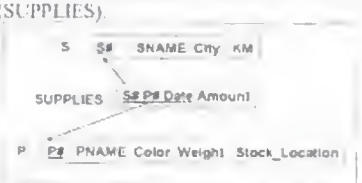
a) What is meant by each of the following terms
   I. Data model
   II. System catalogue.
   III. Data integrity.
   IV. Schema-based constraints with the relational model
b) Consider the following company DB. It stores information about employees (identified by SSN, with salary and phone attributes) and departments (identified by dept ID, with department name and budget as attributes). Employees work in departments. The DB records the interval during which an employee works for a department. Draw an ER diagram that describes each of the following situations.
   I. Employee is not allowed to work in a department for two or more intervals
   II. Employee is allowed to work in a department for one or more intervals.

Question 3 (25 points)

(a) Distinguish between transactional and warehouse databases.
(b) A college library holds books for its members to borrow. Each book may be written by more than one author. Any one author may have written several books. If no copies of a wanted book are currently in stock, a member may make a reservation for the title until it is available. Now, it is required that.
   I. Using the E-R Model, design the above database
   II. Map your E-R Model into a relational one.
   III. Write down the required DDL SQL statements to implement your design on MS SQL Server 2005 showing the required schema-based constraints.

Question 4 (25 points)

(a) Discuss briefly the RAID technology showing its main configurations
(b) Consider the following small supplier-part-database, represented by its schema diagram. The database contains information about suppliers (S), parts (P), and a relation about which parts a supplier has supplied (SUPPLIES).



Formulate each of the following queries in relational algebra and SQL statement(s)
   I. Without duplications, find the KM values of all suppliers in *Cairo*.
   II. Find the name of parts with a weight between 10 and 15
   III. Find the amount of every part, which has been supplied by a supplier in *Alex*.
   IV. Find the names of the suppliers, which have delivered at least 250 green parts that are stored in *Tanta*

Best Wishes
Dr. Hisham Saied Mahmoud

Faculty of Engineering. Algorithms & Data Structures.
Computer & A. Control Eng. Dept. *Time Allowed :- 3 hours* 3rd Year Students.

ANSWER THE FOLLOWING QUESTIONS. YOU MAY ASSUME ANY MISSING DATA.

Question 1 (20 points)

a) Trace the action of the binary Search algorithm, including listing the values of Low, High and Middle for the list 1000, 750, 650, 500, 400, 300, 150, 10, 0 for each of the following search elements. (i) 700 (ii) 500

b) Design a C++ structure to represent a course in terms of its Id, Name, and Type. The course type can be one of the following cases {Mandatory, Selective, Project}. Then write two C++ functions, one to read from the keyboard a course data and the other to print the data stored in a course

c) Write a C++ function (s) to implement the merge sort algorithm.

Question 2 (20 points)

a) What is a data type? What is an ADT? Give at least one example

b) What is a C++ class? What is an object? Give at least two examples

c) Write one C++ function to compute the minimum, the maximum, and the average values of a given array. The array is defined by its size and its base pointer

d) Design and implement an ADT called Complex to represent complex numbers with the following operations:

- A default constructor
- A constructor
- Add() to add two complex objects
- Sub() to subtract two complex objects
- Mul() to multiply two complex objects.

Question 3 (25 points)

a) What does the following program print out? Explain.

```
#include <iostream>
#include <string>
using namespace std;
int foo(int *a, int n) { if (n == 1) return a[0]; return a[n-1] + foo(a,n-1);
void main() { int n = 5, int *a = new int [n], for (int i=0;i<5;i++) a[i]=i+3;
cout<<foo(a,n)<<endl; }
```

b) Write an algorithm that finds the k th smallest element in an array of size N by modifying the selection-sort algorithm.

c) The insertion sort works by having the sequence 0 through i-1 already sorted. Then, item i is inserted into its proper position in the sorted sequence by shifting the larger items. This process is repeated for i going from 2 to the array size. Thus, the insertion sort works just like the usual approach for sorting a hand of playing cards. Write C++ function for an insertion sort that has an array of integers and the array size for its arguments. Do a timing analysis of the routine to determine the order of its time requirements.

Question 4 (20 points)

(a) Write a C++ function called CopyList() that takes a linked list and returns a complete copy of that list

(b) Write a C++ function called Count() that counts the number of times a given int occurs in a linked list.

Best Wishes
Dr. Hisham Saied Mahmoud

Tanta University,
Faculty of Engineering,
Computer & Control Engineering department,
Date: 17-1-2008

Final Term Exam
Compiler Design
3rd year
Allowed Time: Three Hours

Answer Only Five Questions (ملحوظة هامة: الاسئلة فى ورقتين)

The First Question

(a) What is each of the following terms in compiler design means: **Translator, Preprocessor, Compiler, Self-resident translator, and Cross-translator**?

(b) Illustrate a compiler phases and the aim of each phase when the parser is implemented as a main program that calls the scanner and the code generator as subroutines.

(c) For the following source code statement:

```
if x > 0  then      begin x := 50; y := 70 end
          else      begin x := 50; y := 40 end
```

1. Show the output of each of the main three phases of a compiler.
2. Show the output if an interpreter is used.

The Second Question

(a) What is the main functionality of a symbol table? Provide two implementation techniques of such table and an advantage of each provided technique.

(b) Show a finite state machine in either state graph or table form for the following language: "Strings containing an even number of `zeros` and an odd number of `ones`" What is the input alphabet of this language?

(c) Show the balanced and not balanced binary search trees which would be constructed to store each of the following lists of identifiers:
`Hill, cat, bat, bird, tree, frog, dog, cow`

The Third Question

(a) What is each of the following terms means in compiler design: ***a simple language***, ***a derivation***, ***a terminal***, ***a non-terminal***, and ***a handle***?

(b) Given the following grammar:

```
1. A → A * A        2. A → A / A
3. A → ( A )        4. A → c
```

1. Show a left-most derivation and a derivation tree for `(c*c)/c` input string using the above grammar.
2. Classify the above grammar according to Chomsky's definitions.
3. Is the above grammar ambiguous one? If the answer is yes eliminate its ambiguity.

P. T. O.

The Fourth Question

(a) Show a pushdown machine for the language of the grammar given above in the third question (b).
(b) Write a recursive descent parser for that grammar.
(c) Show the sequence of stacks that occurs when the pushdown machine in (a) parses the string `c /(c * c)`.

The Fifth Question

(a) What is a shift/reduce parser? Outline how a shift/reduce parser may work.
(b) Explain carefully the differences between LR(k) and LL(k) parsing.
(c) Using the following grammar, show the sequence of stack and input configurations as the string `cccd` is parsed with shift reduce parsing.

```
S → S c B
S → c
B → c d
```

The Sixth Question

(a) Why a compiler phases may be separated into front-end and back-end parts?
(b) Write strings of atoms corresponding to the input statement: for i := a to b + c do b := b/2 and then translate them to instructions using a single-pass and a two-pass code generators.
(c) Consider the arithmetic expression: `d / (a + b) / c - (a + b) / c`
1. Use the register allocation algorithm to construct a weighted syntax tree.
2. Write strings of atoms corresponding to this expression.

With my best wishes

Tanta University
Faculty of Engineering
Department of Computer and Control Eng
third Year

final Exam
Microprocessors
Date: 17 -01-2008
Time: 3 hours

Answer the following questions

First question:

(a) What is the function of Data bus, Address bus and Control bus? Show how these buses interconnect various system components.

(b) Briefly describe the three main parts of the system memory.

(c) What is the purpose of the segment register in protected mode memory addressing?

Second question:

(a) What is the main purpose of each of the following register: BX, CX, IP, and CS? Which microprocessors contain an FS and GS segment registers?

(b) Determine the memory location addressed by the following real mode 80286 register combinations: DS=2000H and SI=1002H, DS=1000H and DI=2000H, SS=2300H and BP=3200H, and DS=A000H and BX=1000H

(c) Which 32-bit register or registers are used as an offset address for data segment data in the Pentium 4 microprocessor?

Third question:

(a) Briefly describe the direct addressing and register indirect addressing modes.

(b) Suppose that DS = 0210H, and BX = 0310H. Determine the memory address accessed by each of the following: (a) MOV AL,[1243H] and (b) MOV EAX,[BX].

Fourth question:

(a) Describe the purpose of the D- and W-bits found in some machine language instructions.

(b) In a machine language instruction, what information is specified by the MOD field?

(c) If the register field (REG) of an instruction contains a (010) and W=0, what register is selected, assuming that the instruction is a 16-bit mode instruction?

(d) What memory-addressing mode is specified by R/M = 001 with MOD = 00 for a 16-bit instruction?

Tanta University
Faculty of Engineering
Department of Computer and Control Eng.
third Year

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final Exam
Microprocessors
Date: 17-01-2008
Time: 3 hours

Answer the following questions

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أسس التحكم الآلي ماستر

Tanta University
Faculty of Engineering
Computer and Control Engineering Department
Course : Automatic Control **Term : 1st (2006/2007)**
Examiner : Prof. Ahmed F. Amer **Time : 3 Hrs**

Attempt the following Problems :

1. For the control system having the following transfer function

$$G(s)=\frac{C(s)}{R(s)}=\frac{\frac{s+2}{s^3+8s^2+19s+12}}{}$$

a) find state-space model in the canonical form.

b) Find the eigenvalues and check the system stability

c) Check the system controllability and observability.

d) Find the nonsingular matrix P that will diagonalize the system matrix "A" such that;

$$\Lambda=P^{-1}AP=diag(\lambda_i)$$

where $(\lambda_i's)$ are the eigenvalues of the matrix "A".

e) Obtain the state transition matrix $\phi(t)$.

2. Consider the control system shown in the following block diagram. It is desired to determine the range of "K" for which the system is stable using Nyquist criterion technique.

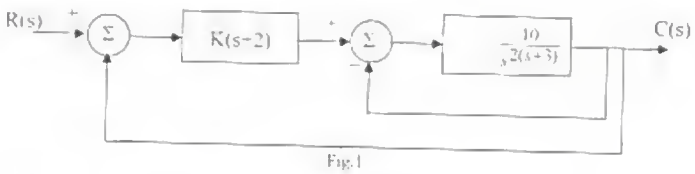

Fig.1

3. The figure represents a plot for the log magnitude curve of a forward transfer function $G(j\omega)$ of a unity feedback system (the drawing is not to scale):

a. Find the system transfer function G(s)

b. Find the gain margin and phase margin.

c. Is the closed-loop system stable.

d. If an amplifier of gain K is added in cascade with the forward transfer function found above, find the limiting value of K for a stable operation of the system.

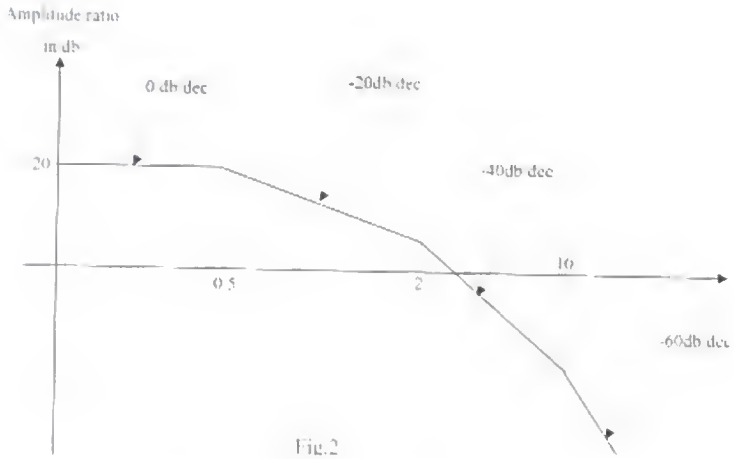

Fig.2

4. a) Apply Routh-Hurwitz stability criterion to check the stability of the system having the following characteristic equation.

(i) $s^5 + s^4 + 4s^3 + 4s^2 + 2s + 1 = 0$

(ii) $s^4 + 10s^2 + 16s + 160 = 0$

b) A simplified form of the open-loop transfer function of the airplane with the autopilot in the longitudinal model is:

$$G(s)H(s) = \frac{K(s+a)}{s(s+b)(s^2+2\zeta\omega_n+\omega_n^2)}$$

Such a system involving an open-loop pole in the right-half s-plane may be conditionally stable:

(i) Sketch the root-locus plot when a = b = 1, $\zeta = 0.5$, and $\omega_n = 4$.

(ii) Find the range of "K" for stability.

Tanta University 3th year computer Dept.
Time 3 hrs digital signal processing Jan 2008

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1. For the following two signals shown below

a) find the Z transform of each signal.
b) find the Fourier transform of each signal.
c) find the discrete Fourier transform N=4.
d) find the convolution of the two signals.
e) compute this convolution using Z transform.
f) compute this convolution using DFT N=4.

---

2. Find and sketch the unit sample response for the system y(n)=5/6y(n-1)-1/6y(n-2)+x(n). Find the DFT of the unite sample response (N=3). If a unit step input is applied find the output using Z transform .

---

3. Find and sketch the unit sample response for the system y(n)=x(n)+0.5x(n-1)+0.25x(n-2). Find the Z transform, the Fourier transform and the DFT of the unite sample response (N=3).

---

4. Transform the following analog filters to digital filters using impulse invariant method and the bilinear transform with T=1 sec.

$H_1(s)=1/(s+1)$ $H_2(s)=s/(s^2+s+1)$

Tanta University
Faculty of Engineering
Computer Engineering and
Automatic Control Department

Course Title: Automatic Control **Time allowed: 3 hour**
3rd year undergraduate

Final Exam

Answer the following problems :

1. The schematic diagram of a servomechanism is given in the figure shown below. The system constants are as follows:
   Synchro sensitivity, K_s = 1 volt/deg.
   Amplifier gain, K_A = 20 volt/volt
   Motor torque constant, K_t = 10^{-3} N.m/volt
   Load inertia, J_L = 1.5×10^{-5} g.m2
   Viscous friction, f_L = 1×10^{-5} Nm/rad/sec
   Tachometer const., K_t = 0.2 volt/rad/sec

   Motor inertia and friction are assumed to be negligible.

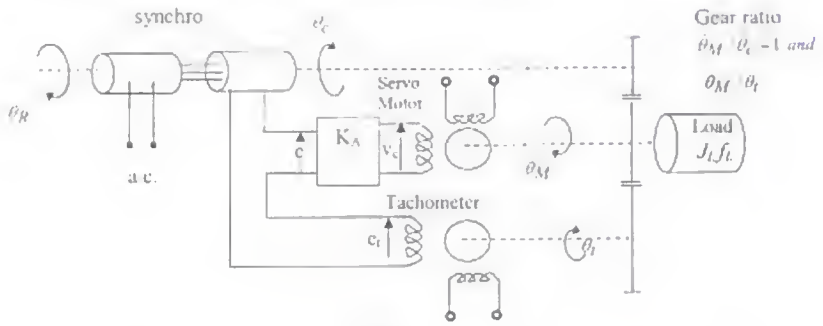


Fig 1

a) Find the value of ζ assuming that the tachometer is disconnected. Determine also the steady-state error corresponding to an input velocity of 1 rad/sec.
b) Determine ζ when the tachometer is included as part of the system.
c) The tachometer is now removed and the amplifier is replaced by a proportional Plus integral amplifier whose output voltage is given by $v_c = K_A e + K_A \int e$, compare the steady-state behavior of the system with that of, part (a)

2. a) The block diagram of a servomechanism is shown in figure below. Determine the value of system gain K and tachometer gain K_t so that the maximum overshoot to a unit step response is 40 percent and peak time is 0.8 second

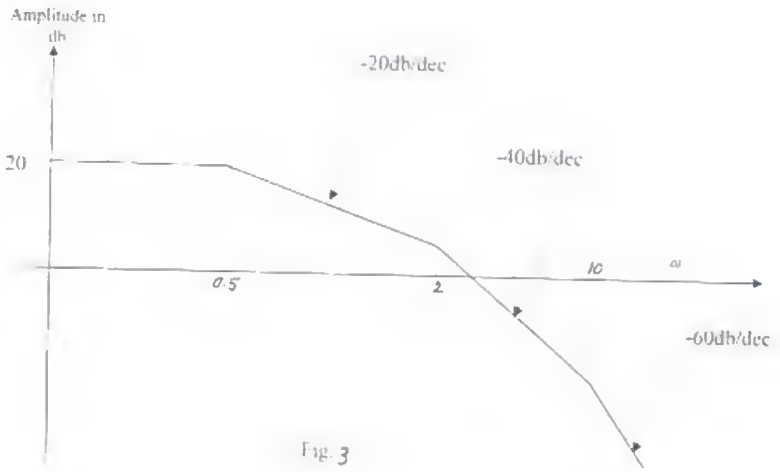


Fig. 3

6. Consider a unity feedback system with an open-loop transfer function of,

$$G(s) = \frac{K}{s(s+1)(s+4)}$$

The system is to be compensated according to the following design specifications

Damping ratio, $\zeta = 0.5$,

Natural frequency, $\omega_n = 2$ rad/sec.

Design a suitable compensator for this system such that it achieves the above design requirements .

٢ حاسبات نظم شتاء

Faculty of Engineering,
Computer & A. Control Eng. Dept. **Time Allowed :3 hours**

Operating System Concepts.
3rd Year Students.

Answer the following questions. You may assume any missing data.

Question 1:

A What is a system call? What is the purpose of system calls? Give at least four examples for system calls.

B What is a process? What is PCB? What are the major activities of an OS in regard to process management?

C Distinguish between mechanism and policy. Why the separation of policy from mechanism is a very important principle in OS design?

D Suggest two main models for process communication. Provide a simple comparison in terms of advantages and disadvantages.

Question 2:

A What is swapping? Show the effect of swapping on the OS design in terms of process transition states.

B What are the five major activities of an operating system in regard to process management?

C Distinguish between process switching and Context switch. Show the main steps to switch the CPU from a process to another.

D When a process creates a new process using the fork () operation, which of the following state is shared between the parent process and the child process?

i. Stack ii. Heap iii. Shared memory segments.

Question 3:

A Distinguish between short-term and long-term schedulers.

B Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use non-preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

(I) What is the average turnaround time for these processes with the FCFS scheduling algorithm?

(II) What is the average turnaround time for these processes with the SJF scheduling algorithm?

(III) The SJF algorithm is supposed to improve performance, but notice that we chose to run process P1 at time 0 because we did not know that two shorter processes would arrive soon. Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used. Remember that processes P1 and P2 are waiting during this idle time, so their waiting time may increase. This algorithm could be known as future-knowledge scheduling.

Question 4:

A How could a system be designed to allow a choice of operating systems to boot from? What would the bootstrap program need to do?

B Provide two programming examples in which multithreading provides better performance than a single threaded solution.

C What are two differences between user-level threads and kernel-level threads? Under what circumstances is one type better than the other?

D What resources are used when a thread is created? How do they differ from those used when a process is created?

Best Wishes,
Dr. Ilsham Saied Mahmoud

TANTA UNIVERSITY — 3rd Year Exam - 1st Semester, 2007/2008

Faculty of Engineering — Elective Course (1): Electrical Communications

Dept. of Computer Engineering — 6/1/2008 — Time: 3 Hrs — Dr. A. Shalaby

Answer the following questions

1- a) Using the properties of the unit impulse function evaluate the following integral

$$\int_{-\infty}^{\infty} (t^3 - t\cos\pi t)\,\delta(t-1)\,dt$$

b) Find the complex Fourier series of the signal $x(t) = \cos 2\omega_0 t + j\sin\omega_0 t$, and sketch its line spectrum.

c) Find the Fourier transform of $\delta(t)$, a constant A, and the signum function $sgn(t)$, and sketch their Fourier spectra.

2- a) Show how the SSB signal can be generated by the phase-shift method. Sketch the block diagram, and write the equation and the bandwidth.

b) Determine the power content of the carrier and each of the sidebands for an ordinary AM signal having a percent modulation of 80% and a total power of 3 kW.

c) Sketch the block diagram of the AM superheterodyne receiver and explain its operation and the function of each block.

3- a) Show how the narrowband FM signal can be generated . Sketch the block diagram, and write the equation and the bandwidth.

b) A frequency-modulated signal which is modulated by a 4-kHz sine wave reaches a maximum frequency of 100.02 MHz and minimum frequency of 99.98 MHz. Sketch the FM signal, and find the modulation index and the bandwidth .

c) Sketch the block diagram of a simple FM superheterodyne receiver and explain its operation and the function of each block.

4- a) What are the communications satellite's orbits and what are the types of each of them? What is the altitude (height) of a communications satellite in the geostationary orbit?

b) Sketch the block diagram of a transponder of a C-band communications satellite (6/4 GHz satellite) and explain the function of each block.

c) What are the general forms or types of the communication systems?. In a direct wave communication system, the transmitter transmits an ontput power of 100 W at 10 GHz. The transmitting antenna has a gain of 36 dB, and the receiving antenna has a gain of 30 dB. What is the received power at a distance of 40 km.

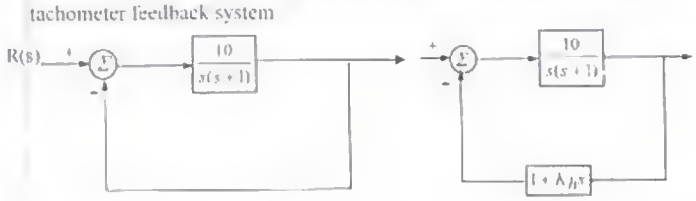
Tanta University
Faculty of Engineering
Computer Engineering and
Automatic Control Department

Course Title: Automatic Control **Time allowed: 3 hour**
3rd year undergraduate

Final Exam

Answer the following questions:

1. Consider the system shown in Fig 1(a). The damping ratio of the system is 0.137 and the undamped natural frequency is 3.16 rad/sec. to improve the relative stability, we employ tachometer feedback. Fig.1(b) shows such a tachometer feedback system



(a) unity feedbck (b) tachometer feedback

Fig. 1 control system

2. For the AC position control system shown in figure below:
   a) Determine the system T.F. $\theta_L(s)/\theta_R(s)$.
   b) Draw the system block diagram.
   c) Construct the signal flow graph of the system guided by the system block diagram

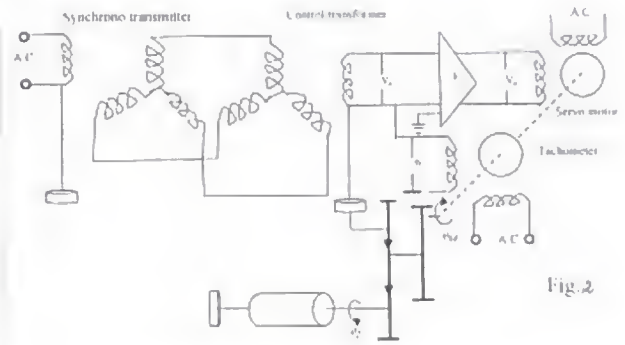


Fig.2

3. A unity feedback control system has the following transfer function:

Tanta University	**Third Year Students**
Faculty of Engineering	**First Term Exam**
Computers & Control Department	**January 2008**
Fundamentals of Stochastic Processes	***Time Allowed: 3 Hours***

Answer the following *five* questions. You may make use of the table of *normal curve areas*, attached to this exam paper.

Question 1

According to the scientific journal *Chance* (*Vol.13, No.2, Spring 2000*), a research was conducted to estimate the number of pennies required to fill a coin collectors album. The data used in the research were obtained by noting the mint date on each in a sample of 2000 pennies. The distribution of mint dates are summarized in the following table.

Mint Date	Number
Pre–1960	18
1960s	125
1970s	330
1980s	727
1990s	800

(a) Identify the experimental unit for the research.
(b) Determine the variable measured.
(c) What proportion of pennies in the sample have mint dates in the 1960s?
(d) Construct a pie chart to describe the distribution of mint dates for the 2000 sampled pennies.

Question 2

Three-way catalytic converters are installed in new vehicles in order to reduce pollutants from motor vehicle exhaust emissions. However, these converters unintentially increase the level of ammonia in the air. The scientific journal *Environmental Science & Technology (September1, 2000)* published a study on the ammonia levels near the exit ramp of a San Francisco high-way tunnel. The data in the following table represent daily ammonia concentrations (parts per million, ppm) on eight randomly selected days during afternoon drive-time in the summer of a particular year.

AMMONIA

1.53	1.50	1.37	1.51	1.55	1.42	1.41	1.48

(a)Find the mean daily ammonia level in air in the tunnel. Also find the median ammonia level.
(b) Interpret the values obtained in part (a).
(c)Find the range, variance, and standard deviation of the ammonia levels.
(d) Suppose the standard deviation of the daily ammonia levels during morning drive-time at the exit ramp is 1.45 ppm. Which time, morning or afternoon drive-time, has more variable ammonia levels?

continued on page 2

Question 3

At one university, the students are given z-scores at the end of each semester rather than the traditional GPAs (grade point averages). The mean and standard deviation of all students' cumulative GPAs, on which the z-scores are based, are 2.7 and 0.5, respectively.

(a) Translate each of the following z-scores to corresponding GPA scores :

$z = 2.0,\ z = -1.0,\ z = 0.5,\ z$ -2.5

(b) Students with z-scores below 1.6 are put on probation. What is the corresponding probationary GPA?

(c) The president of the university wishes to graduate the top 16% of the students with *cum laude* honors and the top 2.5% with *summa cum laude* honors. Where (approximately) should the limits be set in terms of z-scores? In terms of GPAs? What assumption, if any, did you make about the distribution of the GPAs at the university?

Question 4

It has been shown that the alkalinity level of water specimens collected from the Han River in Seoul, Korea, has a mean of 50 milligrams per liter and a standard deviation of 3.2 milligrams per liter. Assume the distribution of alkalinity levels is approximately normal and find the probability that a water specimen collected from the river has an alkaline level .

(a) Exceeding 45 milligrams per liter.

(b) Below 55 milligrams per liter.

(c) Between 51 and 52 milligrams per liter.

Question 5

A car manufacturer introduces a new model that has an advertised mean in-city mileage of 27 miles per gallon. Although such advertisements seldom report any measure of variability, suppose you wrote the manufacturer for the details of the tests, and you found that the standard deviation is 3 miles per gallon.

This information leads you to formulate a probability model for the random variable x, the in-city mileage for this car model. You believe that the probability distribution of x can be approximated by a normal distribution with a mean of 27 and a standard deviation of 3.

(a) If you were to buy this model of car, what is the probability that you would purchase one that averages less than 20 miles per gallon for in-city driving?

(b) Suppose you purchase one of these new models and it does get less than 20 miles per gallon for in-city driving. Should you conclude that your probability model is incorrect?

Best Wishes

Prof. Dr. Mahmoud M. Fahmy

Normal Curve Areas

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1843	.1879
.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

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